



AIR POLLUTION IN INDIA - GS III MAINS

Q. What is the state of air pollution in India and bring out the initiatives taken by the Indian government to control air pollution? (15 marks, 250 words)

News: *Global project 'paints' evidence of air pollution in India*

What's in the news?

- Researchers and artists joined forces for a so-called “painting with light” international project to make invisible air pollution in India visible, demonstrating the health risks posed to the population.

Key takeaways:

- Combining digital light painting and low-cost air pollution sensors, the scientific team produced photographic evidence of pollution levels in cities across three countries – India, Ethiopia and the U.K. – to spark debate among local communities.

Air Pollution:

- Air pollution may be defined as the presence of any solid, liquid or gaseous substance including noise and radioactive radiation in the atmosphere in such concentration that may be directly and indirectly injurious to humans or other living organisms, plants, property or interferes with the normal environmental processes.

Causes of Air Pollution in Delhi:

Natural factors:

1. Northwesterly Winds:

- Month of October marks the withdrawal of monsoon winds (South-West) from North India, leading to the arrival of North-Easterly winds.
- Monsoon winds carry moisture and rainfall all over the country, whereas **northwesterly winds carry dust from dust storms** originating in Rajasthan and sometimes Pakistan and Afghanistan.
- As per the study conducted by scientists at the National Physical Laboratory, 72 percent of Delhi’s wind in winters comes from the northwest, while the remaining 28 percent comes from the Indo-Gangetic plains.
- One of such examples is a storm of 2017, originated from Iraq, Saudi Arabia and Kuwait that led to a drastic dip in Delhi’s air quality in a couple of days.

2. Low-level Inversion:

- The temperature dip in the month of October.
- **Low-temperature results in low-level inversion** i.e. the layer that stops the upward movement of air from the layers below. It leads to the concentration of pollutants in the air at the lower heights.



3. Wind Speed:

- High wind speed in summers facilitates the faster movement of particulate matters in the air. As the **wind speed decreases in winters**, the air is not able to draw the pollutant away from a region.

4. Landlocked Geography of Delhi:

- Geography of Delhi and the region around in the northern plains is landlocked. On the one hand source wind from North-West is already having pollutants, on the other, the Himalayas obstruct the escape route of air. Moreover, large buildings and other structures in Delhi also reduce airspeed.
- It is the reason that Chennai with the third-highest number of automobiles in India faces far less pollution in the city in comparison as coastal region provides air with an effective route to enter and exit.

Anthropogenic Factors:

1. Industrial Chimney Wastes:

- There are a number of industries which are source of pollution. The chief gases are **SO₂ and NO₂**. There are many food and fertilizers industries which emit acid vapours in air.

2. Automobiles Pollution:

- The toxic vehicular exhausts are a source of considerable air pollution. In all the major cities of the country about 800 to 1000 tonnes of pollutants are being emitted into the air daily, of which 50% come from automobile exhausts.
- According to the IIT Kanpur study, **20% of PM 2.5 in winters comes from vehicular pollution.**
- The exhaust produces many air pollutants including **un-burnt hydrocarbons, CO, NO_x and lead oxides.**

3. Dust Pollution:

- Dust pollution originating from construction activities, raw road sides, from the neighbouring states, **contributes to 56% of PM 10** and the PM_{2.5} load at 59 t/d, the top contributors being road 38 % of PM 2.5 concentration.

4. Paddy Stubble Burning:

- The stubbles left out from the field of paddy during kharif season were burnt out to save time and labour energy for further cultivation makes out the release of pollutants from the states of **Punjab, Haryana, Uttar Pradesh and Rajasthan to settle in the atmosphere of Delhi.**

Government Initiatives:

1. Graded Response Action Plan:



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- The Graded Response Action Plan was made public by MoEFCC in 2017 in accordance with the Supreme Court's ruling in **M.C.Mehta v. Union of India (2016)** addressing the quality of the air in Delhi's National Capital Region.
- According to the degree of pollution, the GRAP is a set of immediate actions to be performed to minimize air pollution, including an odd-even car rationing scheme.

2. Construction & Demolition (C&D) Waste Management Rules:

- Regulations for the management of construction and demolition (C&D) waste have been made public by the government.
- All producers of C&D waste are required by law to separate their waste into the following four categories: concrete, soil, steel and wood, plastics, and bricks and mortar.
- They must then **either deliver their separated waste to processing facilities or to collection centers set up by the local government.**

3. CPCB Monitoring:

- In the Delhi-NCR region, the CPCB has sent out 50 teams to conduct inspections.
- If any anti-pollution criteria are broken, inspection teams will visit the construction site and impose fines.

4. Red Light On, Gaadi Off Campaign:

- The Delhi government has started the "Red Light On, Gaadi Off" campaign to combat air pollution.
- Volunteers holding placards asking commuters to turn off their cars engines while the signal is red are part of this relatively new initiative.
- This has been one of the city government's most intriguing air pollution management projects.
- According to the government, turning off vehicle engines will save pollution and save each vehicle 7,000 per year.

5. National Clean Air Program:

- The National Clean Air Program (NCAP), a five-year action plan to reduce air pollution, create an India-wide network for air quality monitoring, and raise public awareness, was introduced by the government in January 2019.
- The program focuses on developing **city-specific action plans for 102 Indian cities where air quality standards are exceeded.** By 2024, it seeks to cut PM2.5 levels by 20–30% (compared to 2017 levels).
- The NCAP emphasizes the requirement for strong coordination and cross-sector cooperation among federal agencies, state governments, and local organizations.



6. Odd-Even Scheme:

- According to this initiative, private vehicles whose registration numbers terminate in an odd digit can drive on roads on odd dates, whereas those whose registration numbers end in an even digit can drive on even dates.
- Vehicles utilizing Delhi roads but with registration numbers obtained from other states would also be subject to the laws.

7. Anti-Smog Guns:

- An anti-smog gun sprays water into the atmosphere to rid the air of all dust and other pollutants, thereby reducing air pollution.
- The gun is mounted to a water tank that is part of a mobile unit that can be moved around the city.

8. Smog Towers:

- These massive air purifiers, which are often equipped with numerous layers of air filters, remove pollutants from the air as it flows through them.

9. Pusa Decomposer:

- Scientists at PUSA's Indian Agricultural Research Institute have come up with a simple, practical, and affordable solution to the problem of burning straw and stubble.
- A remedy has been developed for spraying in fields to control agricultural residue decay. In the end, the residue is transformed into manure.

10. Banning of Diesel Generators:

- The Environment Pollution Authority has ordered the governments of Delhi, Haryana, and Uttar Pradesh to outlaw diesel generators, with the exception of emergency and vital services.

11. Potential Banning of Construction:

- Although it hasn't happened yet, the government has made it clear that it is possible for the national capital's pollution levels to keep rising.
- It would include shutting down all thermal energy facilities and businesses that use fuels other than PNG.

Way forward:

1. Use of Happy Seeders:

- Using Happy Seeders allows farmers to plant wheat seeds while preserving the organic value of the stubble for the soil, eliminating the need to clean or burn it.

2. ICMR Tech:

- The ICMR has created a solution that can be sprayed on agricultural wastes to transform them into manure. This method needs to be applied widely over the area.



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3. Commercialization of Paddy Straw:

- Since wheat straw is useful and farmers have discovered ways to use it, unlike paddy, the government should find ways to commercialize paddy straw.

4. More Smog Towers:

- To lower the level of smog in the capital, more smog towers, and anti-smog weapons should be erected.

5. Implementation of Legislations:

- Environment-related laws must be upheld in letter and spirit and put into practice. The implementation of the numerous environmental legislation that has been drafted has been exceedingly sluggish.

